Land Navigation

NOTE: THIS IS NOT A COMPLETE GUIDE. You should already be familiar with the topics within this presentation, and should seek additional information for definitions and terminology.

Basic Map Skills

- Identify Map colors
- Identify Map Symbols
- Identify Marginal Information
- Identify Terrain Features

Basic Map Skills

- Identify Grid
- Identify Elevation
- Grid vs. Magnetic Azimuth
- Determine Azimuth
- Back Azimuth
- Determine Distance

Map Colors

- Black - Indicates cultural (man-made) features such as buildings and roads, surveyed spot elevations, and all labels
- Red-Brown - Combined to identify cultural features, all relief features, non-surveyed spot elevations, and elevation, such as contour lines on red-light readable maps

Map Colors

- Blue - Identifies hydrography or water features such as lakes, swamps, rivers, and drainage
- Green - Identifies vegetation with military significance, such as woods, orchards, and vineyards
- Brown - Identifies all relief features and elevation, such as contours on older edition maps, and cultivated land on red-light readable maps

Map Colors

- Red - Classifies cultural features, such as populated areas, main roads, and boundaries, on older maps
- Other - Occasionally other colors may be used to show special information. These are indicated in the marginal information as a rule

TOPOGRAPHIC SYMBOLS
MAN MADE OBJECTS

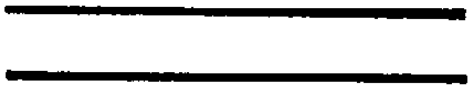
(RED/BROWN)

HEAVY DUTY

HARD SURFACE

(RED/BROWN)

MEDIUM DUTY



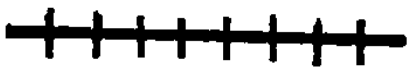
IMPROVED
ROAD

UNIMPROVED
ROAD

TOPOGRAPHIC SYMBOLS
MAN MADE OBJECTS

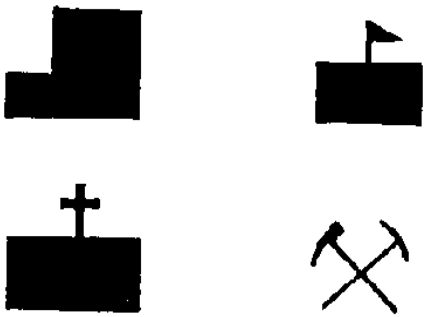
TRAIL

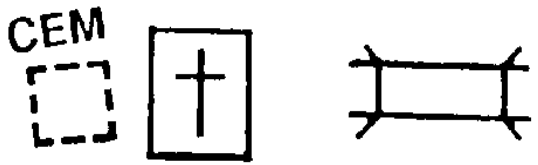
PROMINENT FENCE



SINGLE TRACK RR

DOUBLE TRACK RR





TOPOGRAPHIC SYMBOLS
DRAINAGE AND VEGETATION

STREAM

INTERMITTENT STREAM

LAKE OR POND

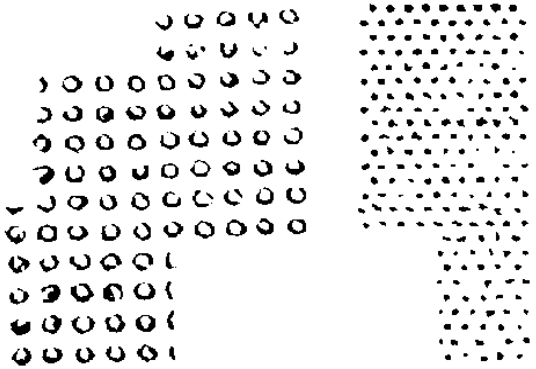
INTERMITTENT LAKE OR POND

TOPOGRAPHIC SYMBOLS
DRAINAGE AND VEGETATION

MARSH OR SWAMP

TROPICAL GRASS

WOODS



VINEYARD/ORCHARD

Identify Map Symbols

Refer to Map Legend

Marginal Information

- Geographic area and scale - top left
- Name of map sheet - top center
- Map edition, map series, and map sheet number - top right
- Legend - bottom left
- Bar scale, contour interval, grid reference box, and declination diagram - bottom center
- Elevation guide, adjoining map sheet diagram, and boundaries box - bottom right

Terrain Features - Major

- Hill
- Ridge
- Valley
- Saddle
- Depression

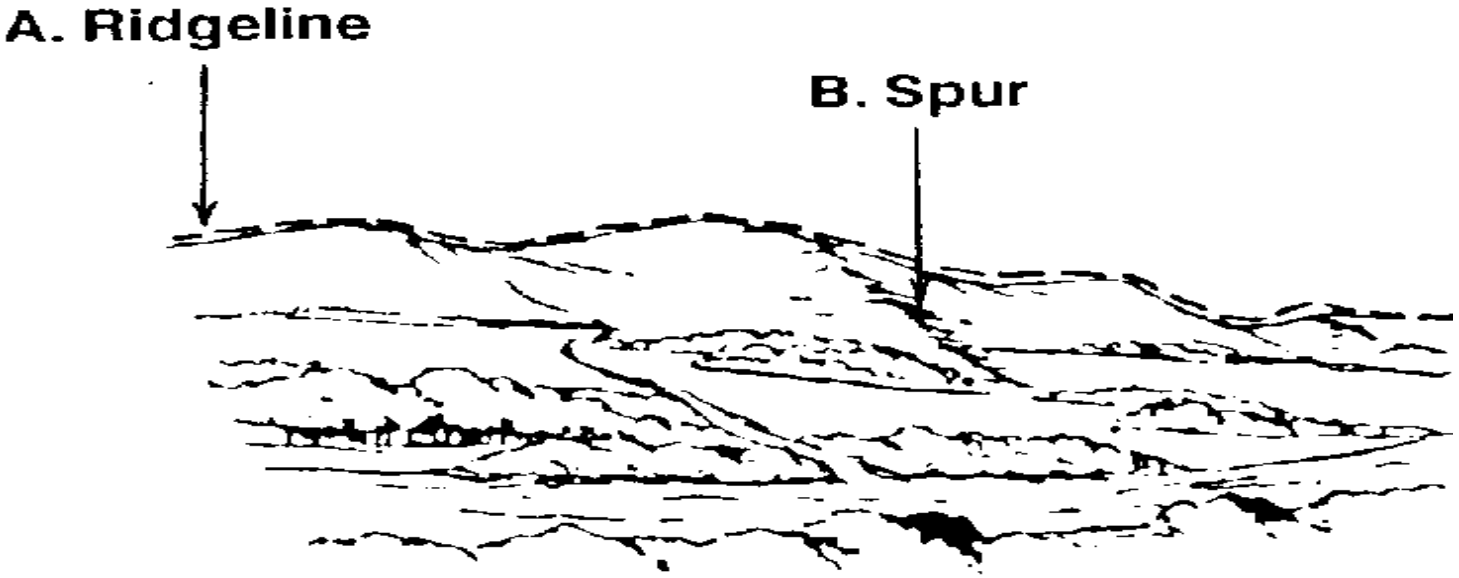
Terrain Features - Minor

- Draw
- Spur

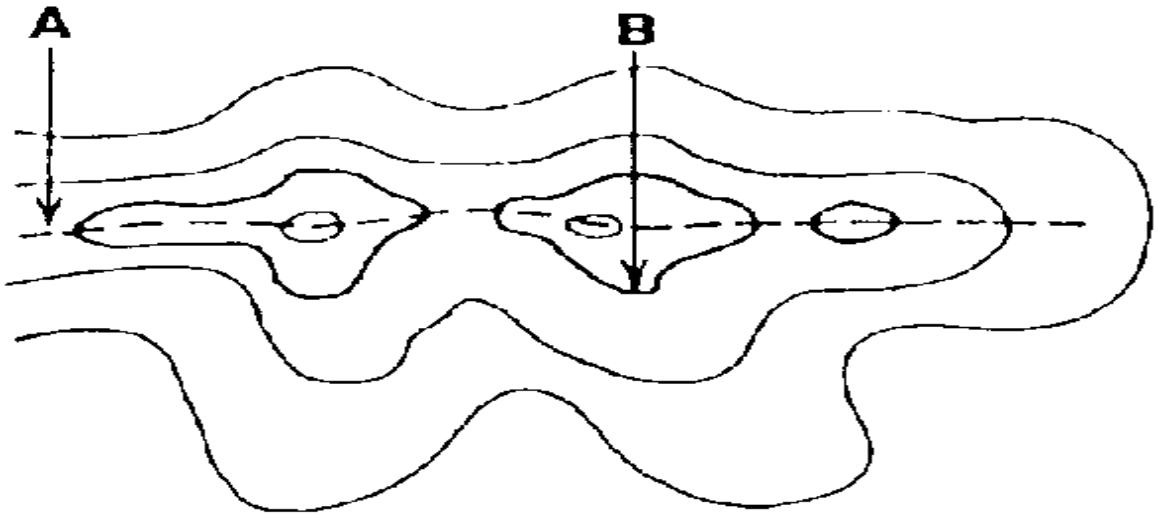
Terrain Features - Supplementary

- Cliff
- Cut
- Fill

ON THE GROUND

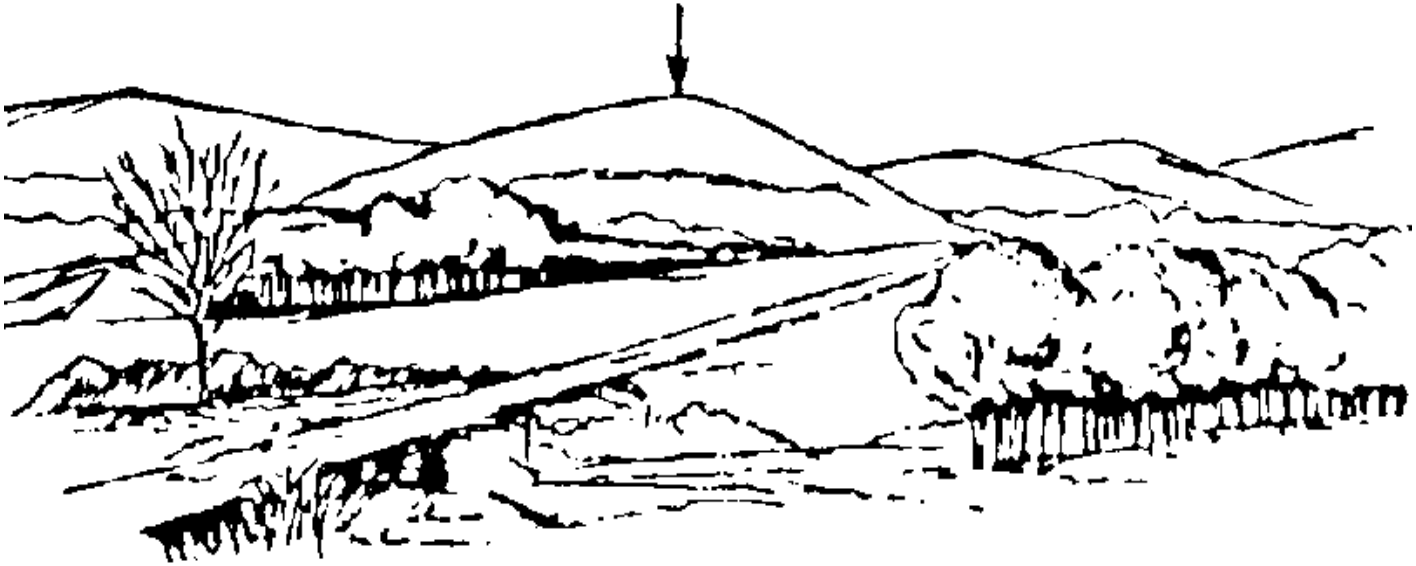


ON THE MAP



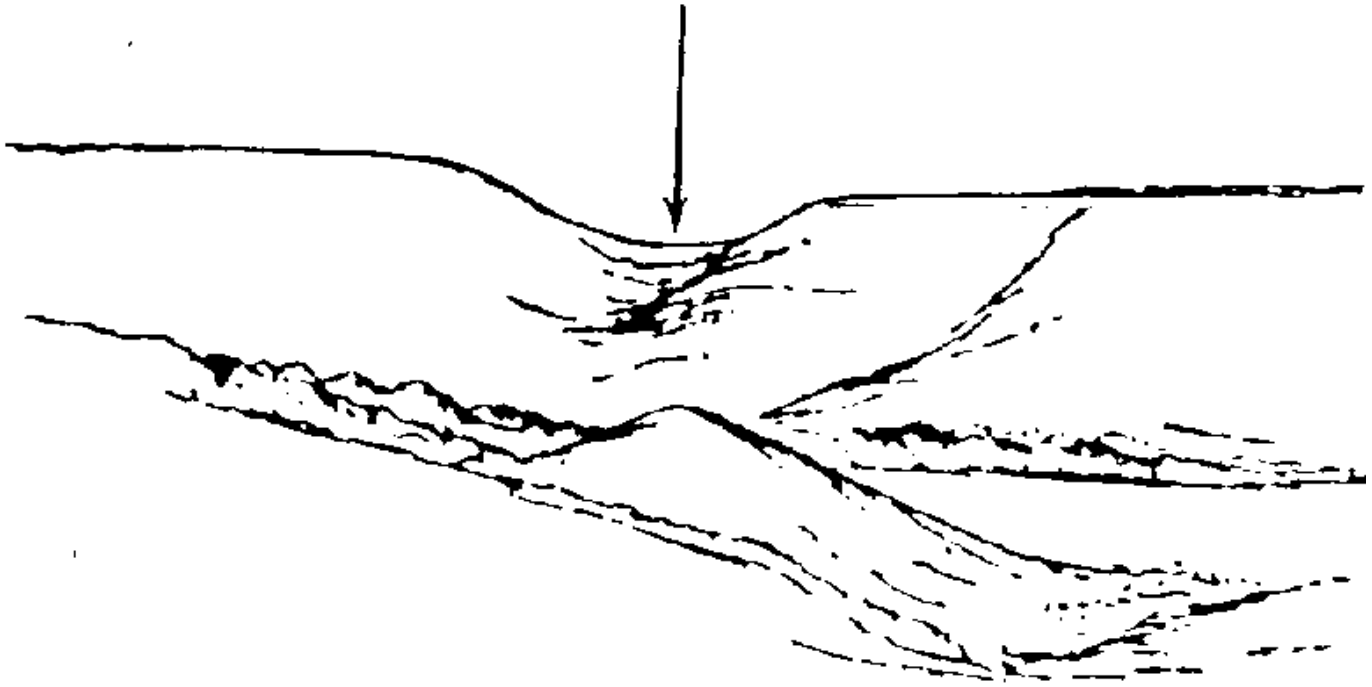
HILLTOP

ON THE GROUND

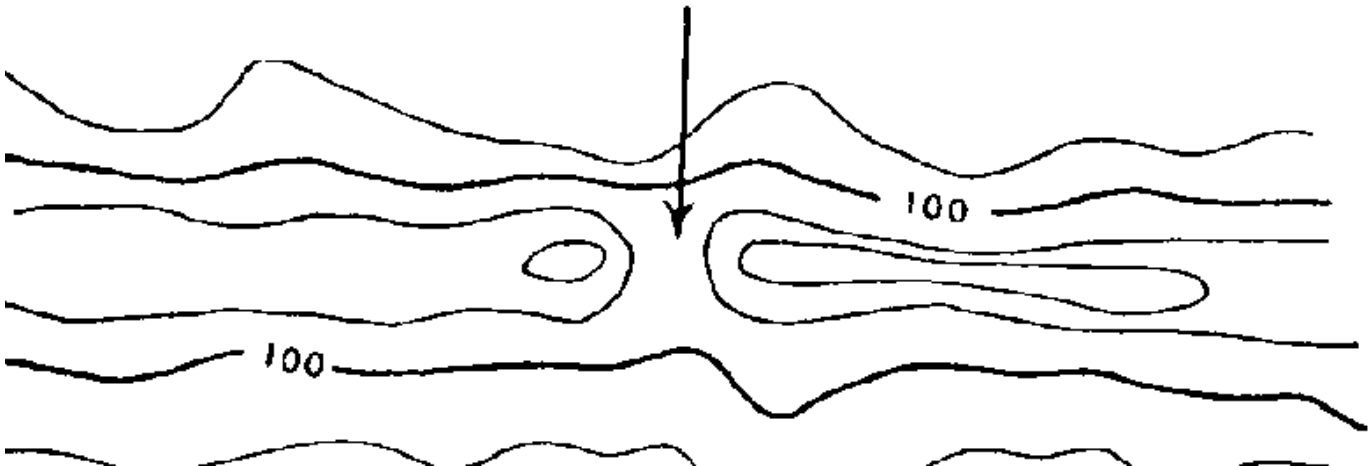


ON THE MAP

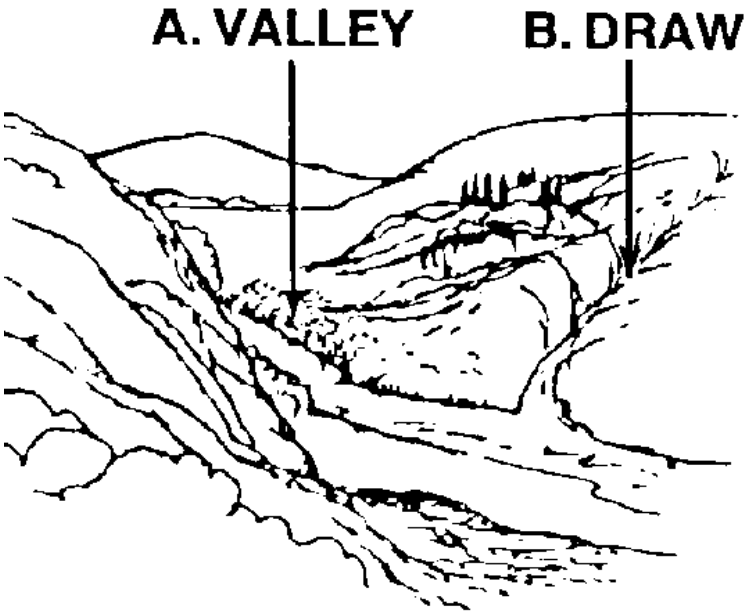
SADDLE ON THE GROUND



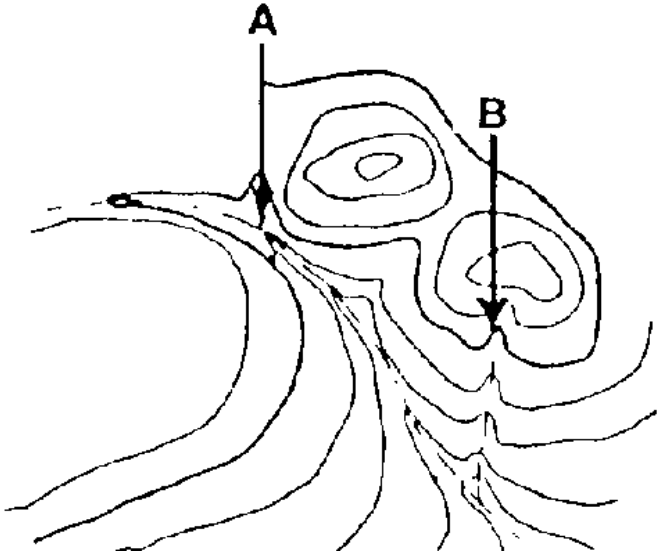
ON THE MAP



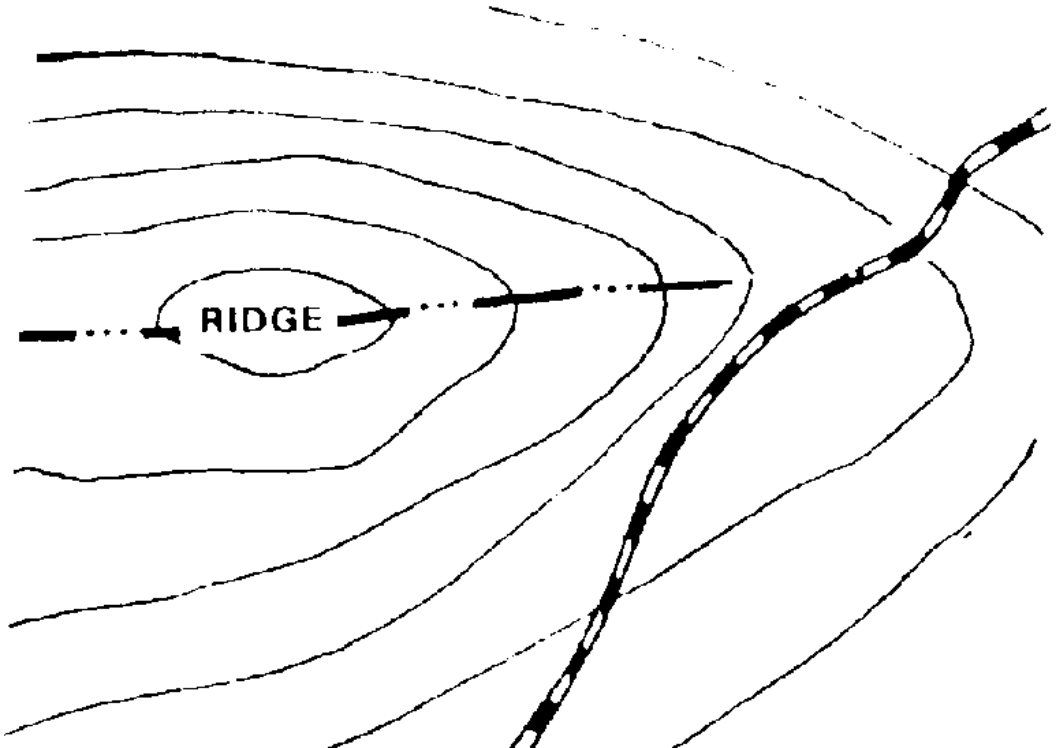
ON THE GROUND



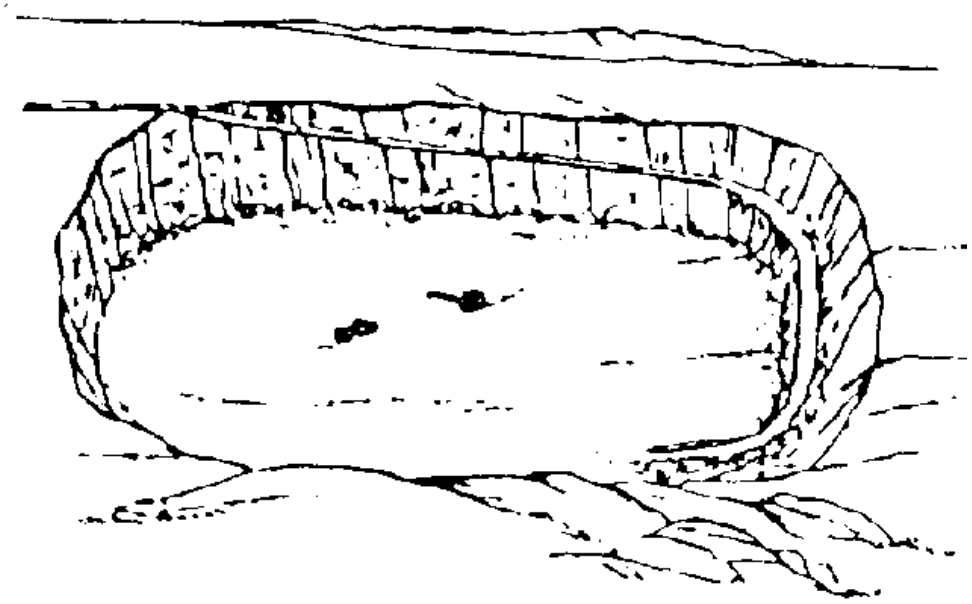
ON THE MAP



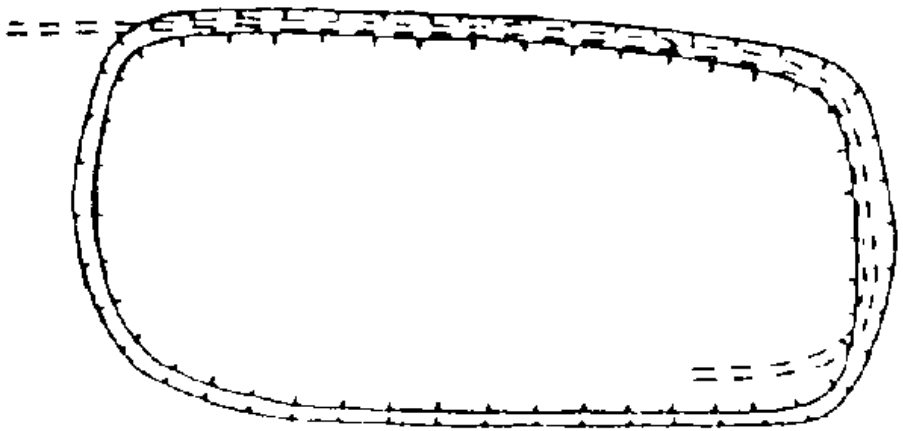
RIDGE

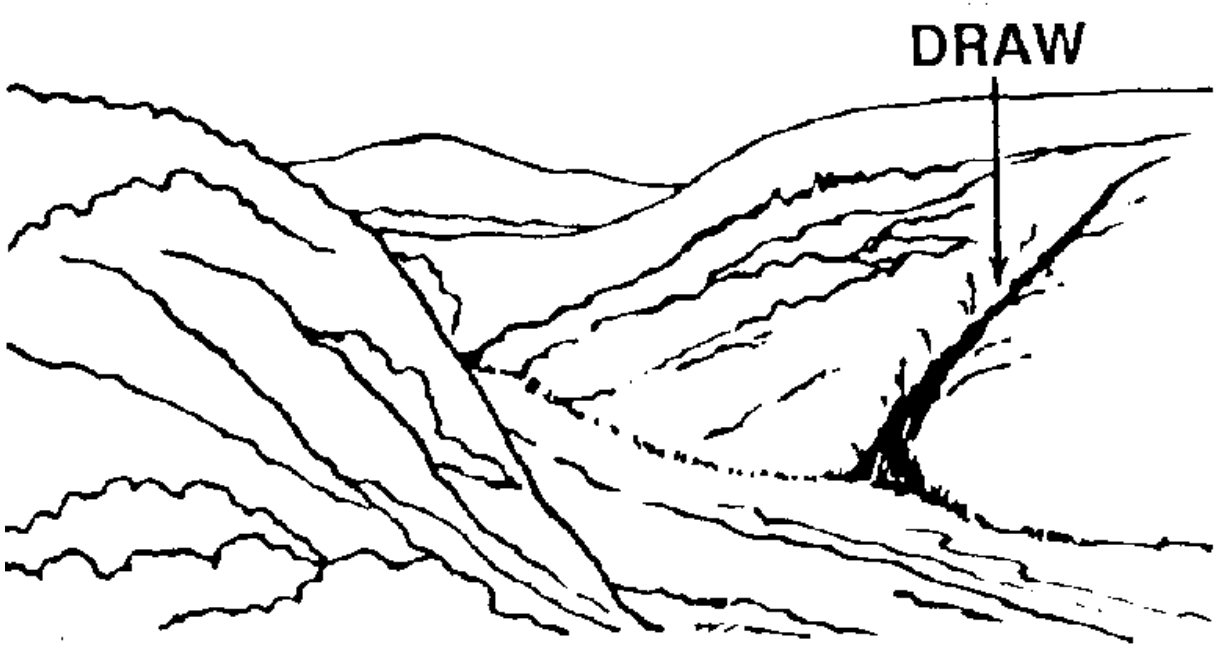


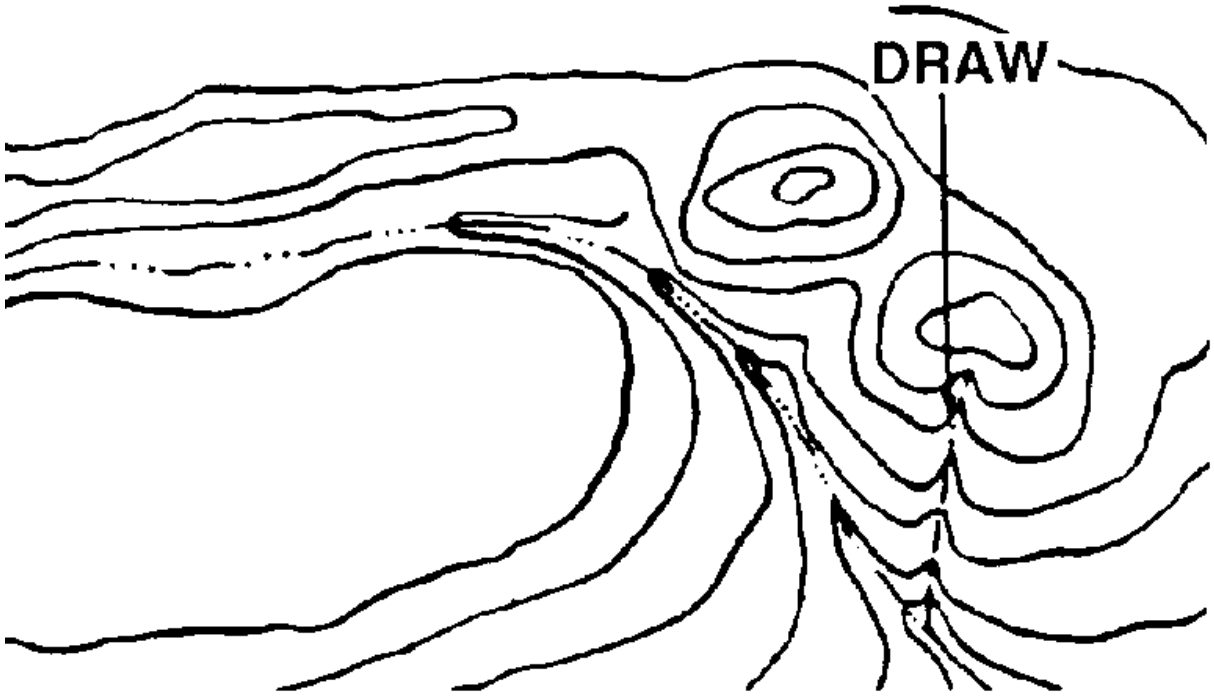
DEPRESSION ON THE GROUND

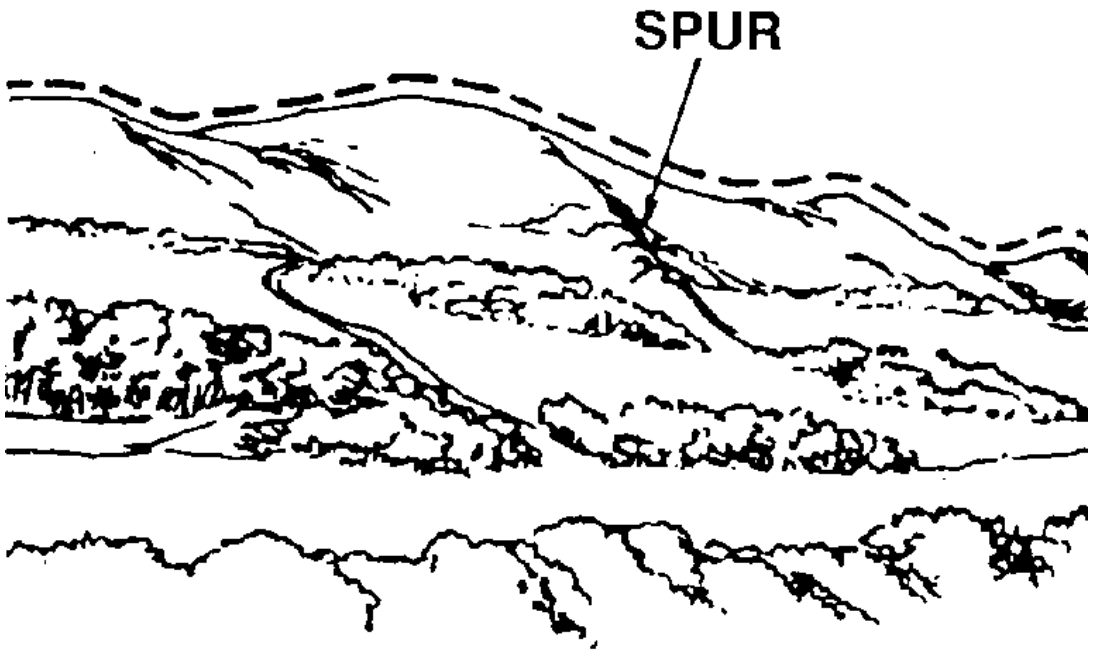


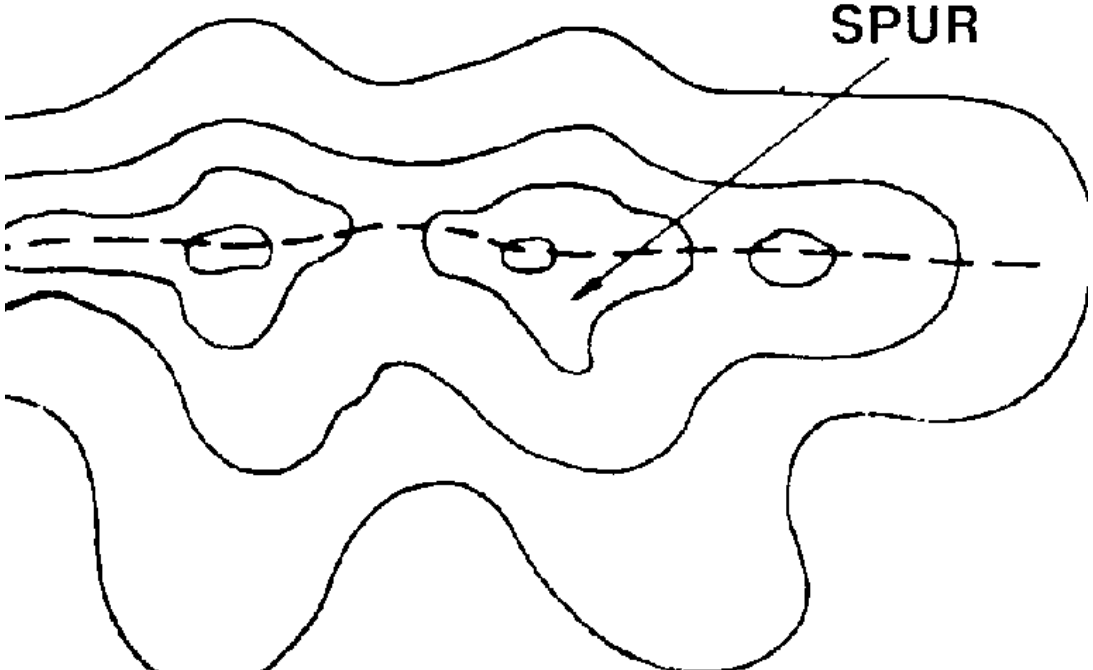
DEPRESSION ON THE MAP

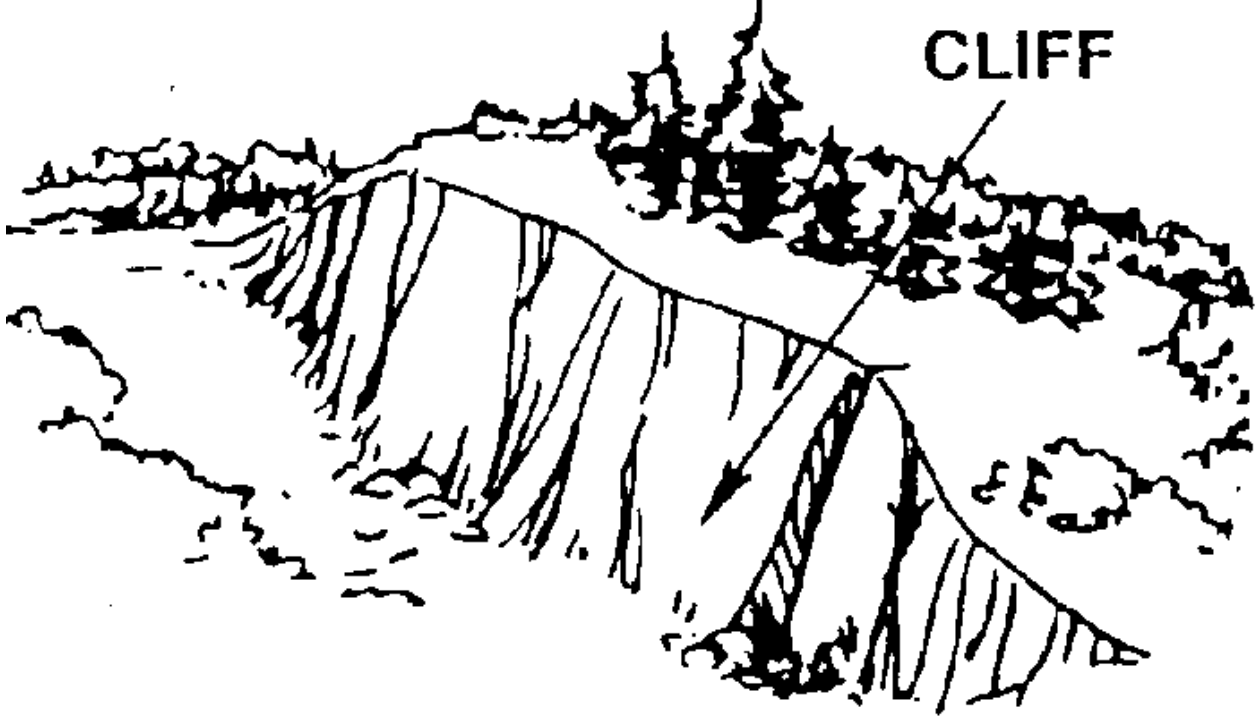


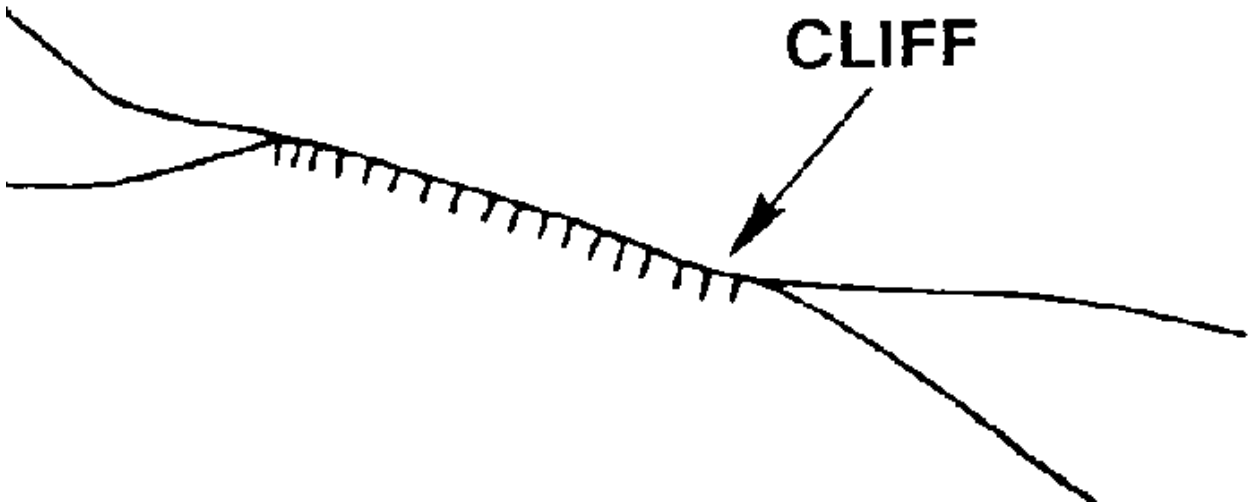

DRAW

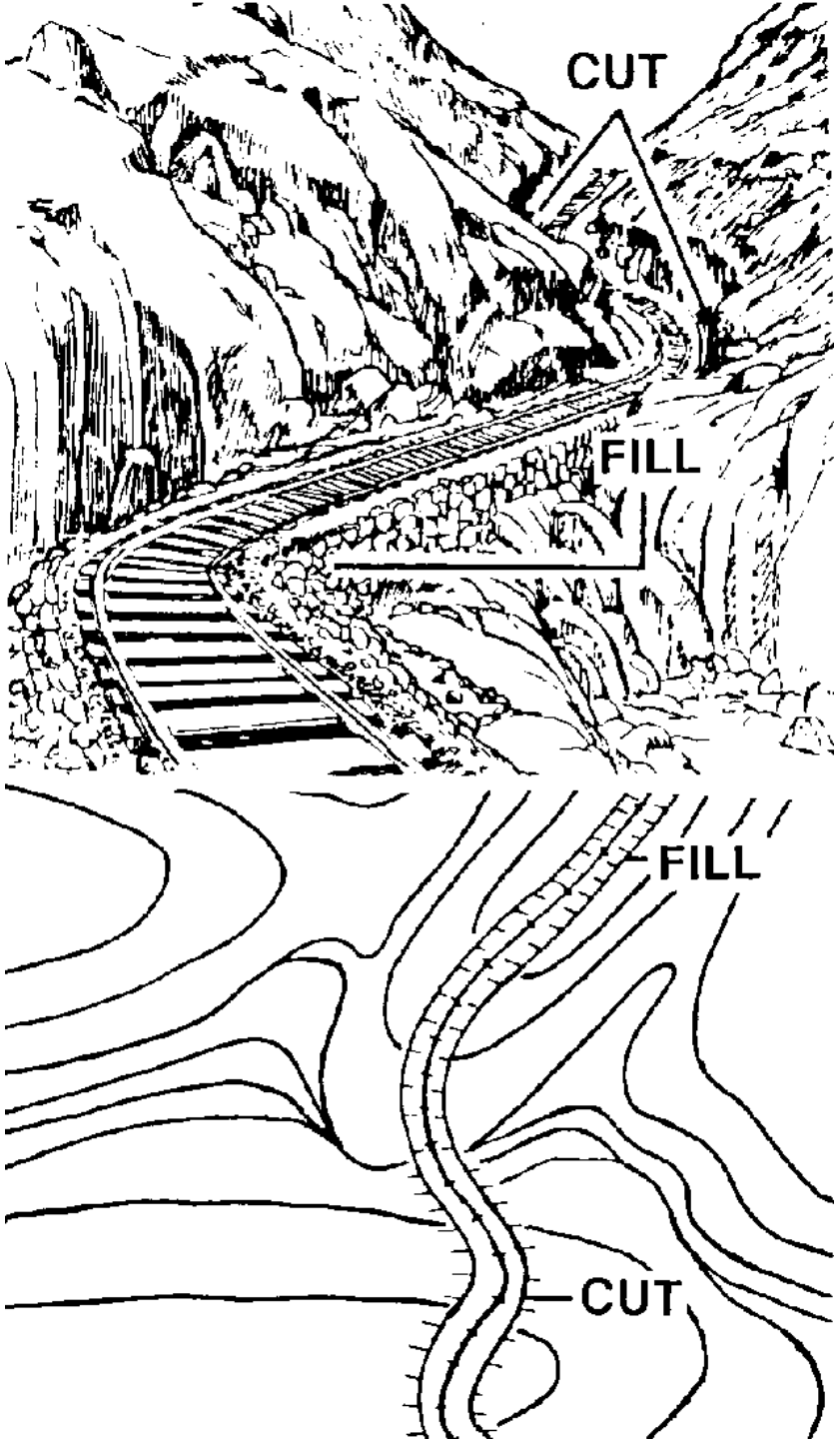

DRAW


SPUR

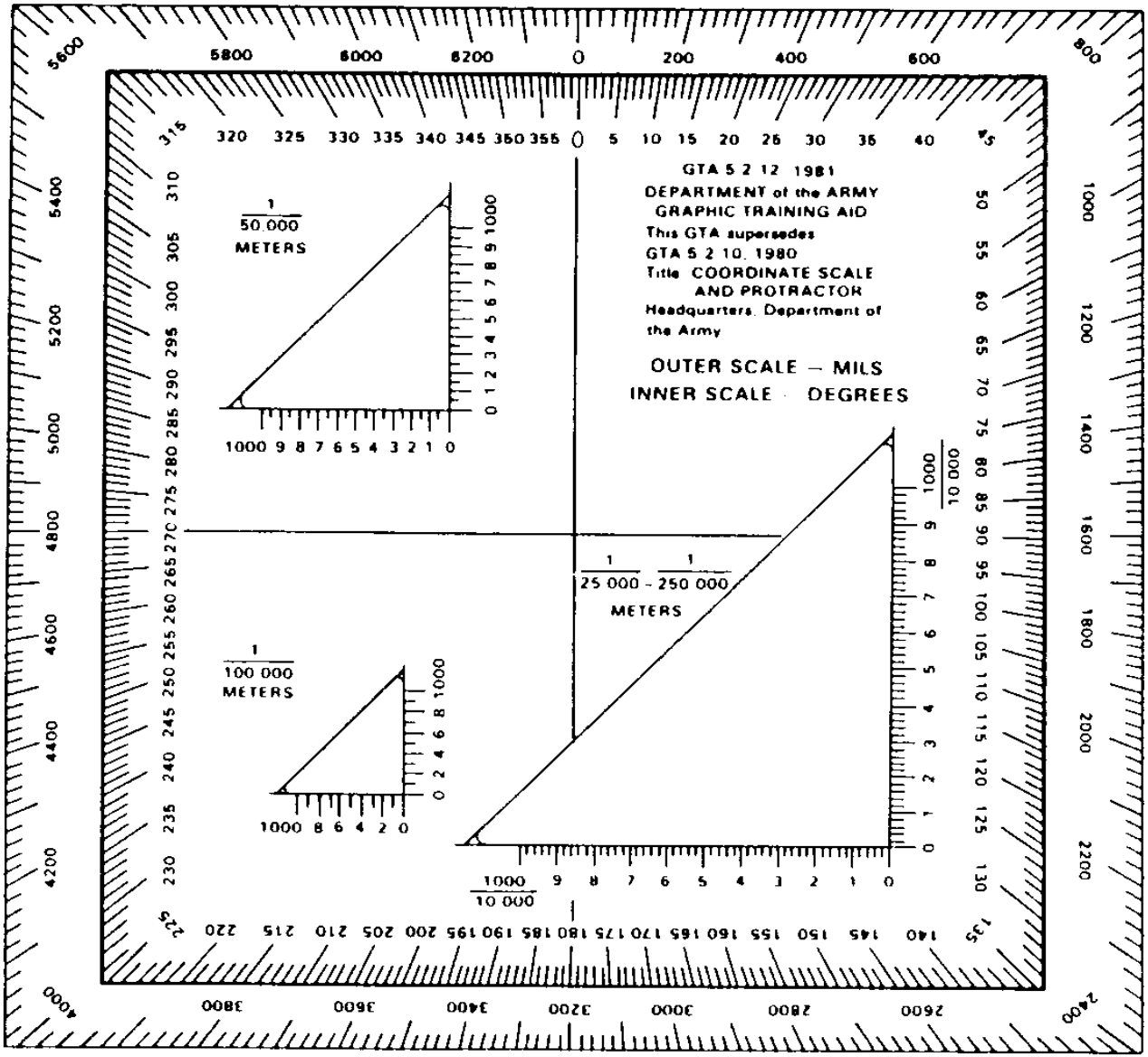

SPUR


CLIFF


CLIFF


CUT
FILL
FILL
CUT

Identify a Grid


GTA 5 2 12 1981
DEPARTMENT of the ARMY
GRAPHIC TRAINING AID
This GTA supersedes
GTA 5 2 10, 1980
Title COORDINATE SCALE
AND PROTRACTOR
Headquarters, Department of
the Army
OUTER SCALE — MILS
INNER SCALE — DEGREES
1/50,000
METERS
1/100,000
METERS
1/25,000 - 1/250,000
METERS
1000/10,000

1
50,000
METERS
0 1 2 3 4 5 6 7 8 9 1000
1000 9 8 7 6 5 4 3 2 1 0

Identifying a Grid

- Read Right then Up
- Bottom left corner identifies first two digits I.e. 12__56__
- Use coordinate scale to identify last two digits I.e. __34__78
- Add proper grid zone designator to front I.e. AB _____

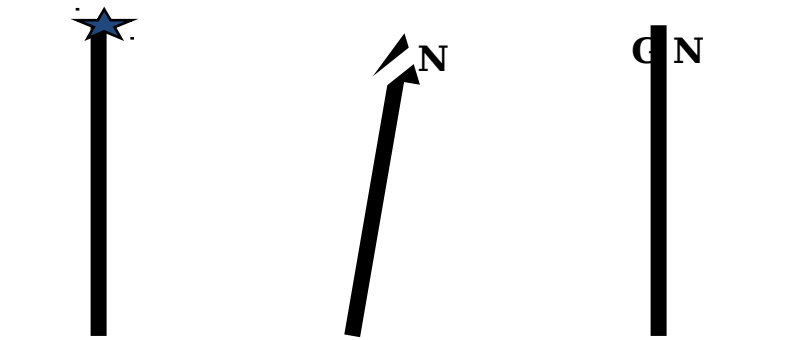
Identify Elevation

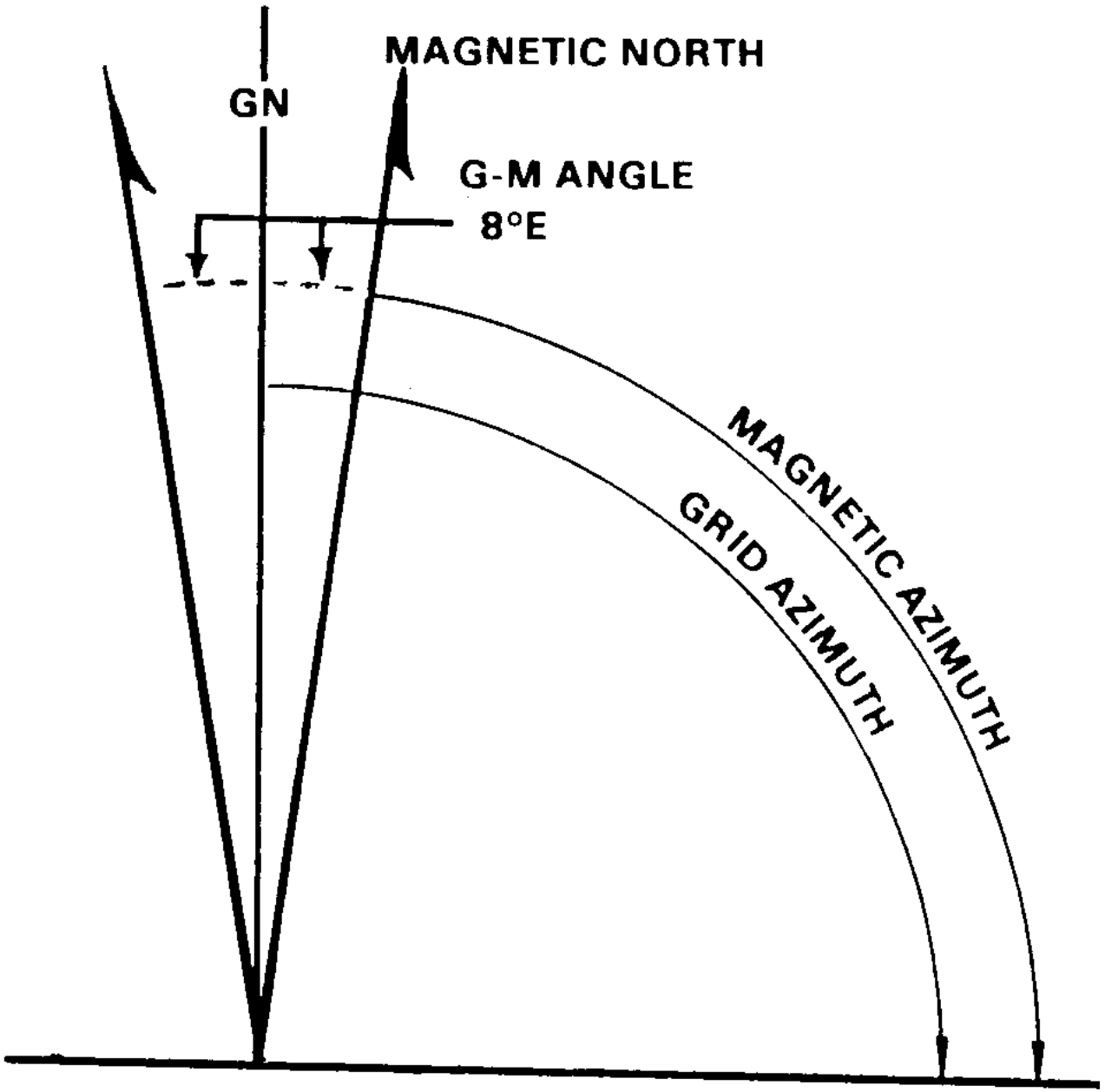
Elevation

- Locate point on the map
- Determine contour interval of map
- Locate index contour line nearest point
- Count number of contour lines up or down that must be crossed to get to point
- Points at top of hill add half the contour interval
- Points at bottom of depression subtract half the contour interval

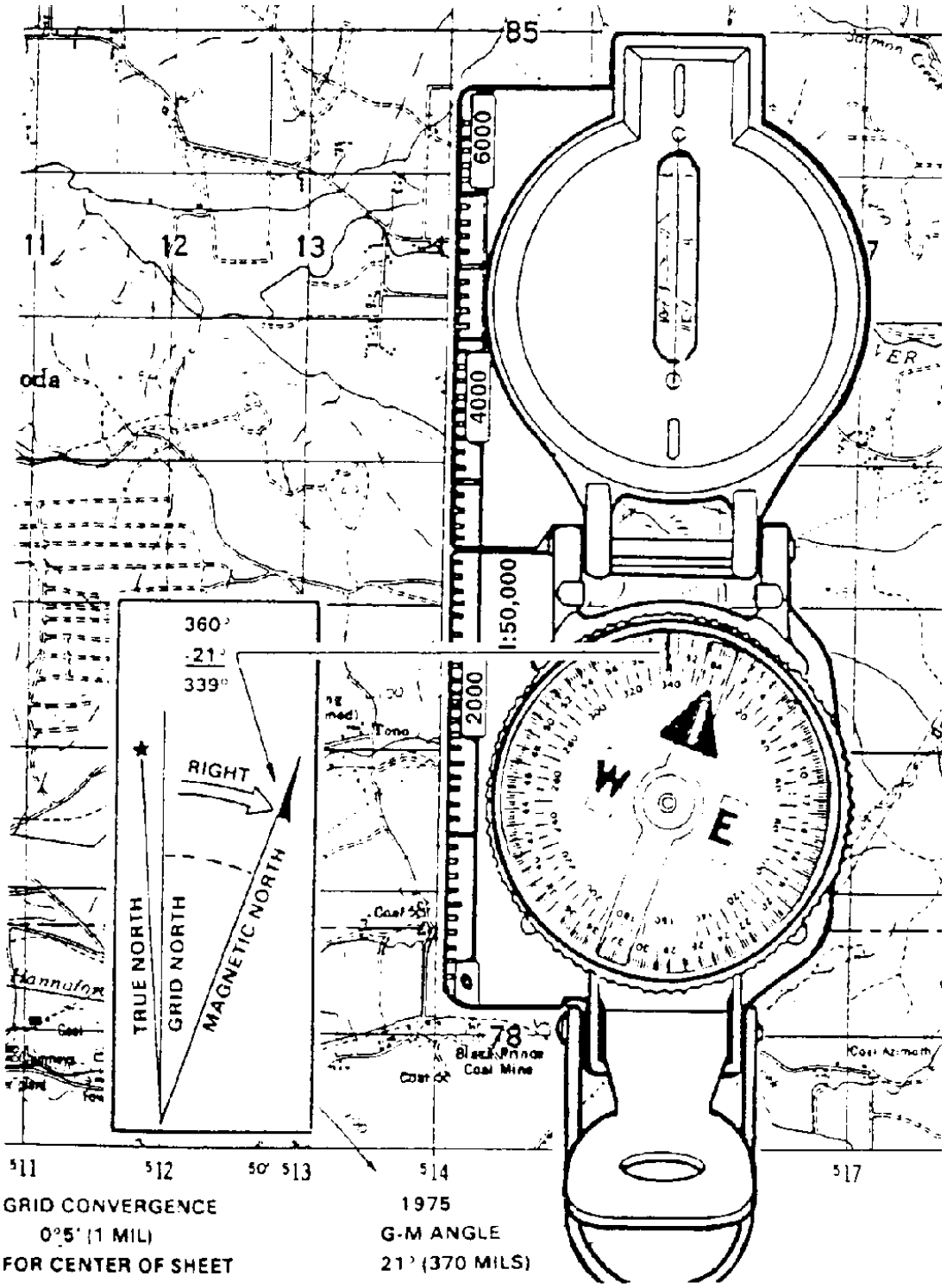
Grid vs. Magnetic Azimuth

THREE NORTH'S




MAGNETIC NORTH
GN
G-M ANGLE
8°E
MAGNETIC AZIMUTH
GRID AZIMUTH
ARBITRARY LINE OR ANY AZIMUTH

Determine Azimuth

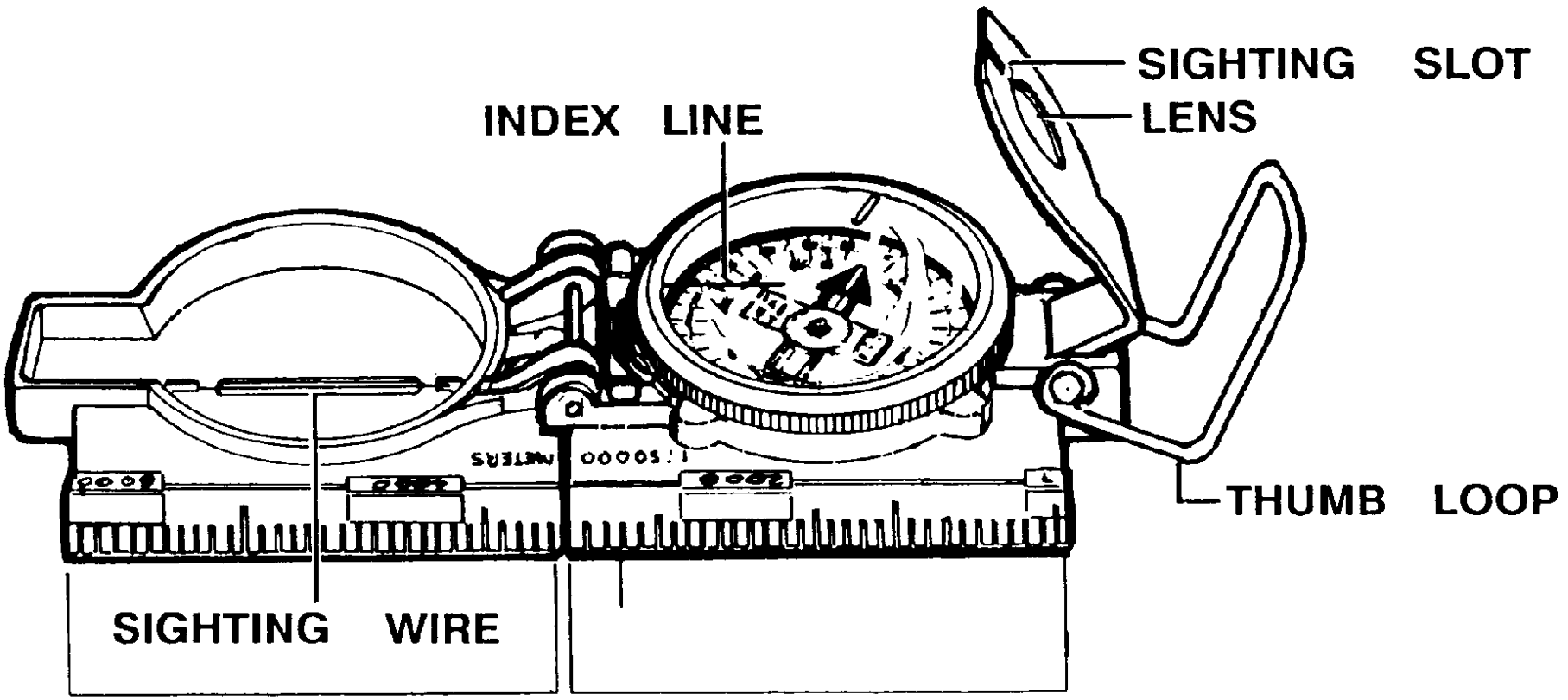


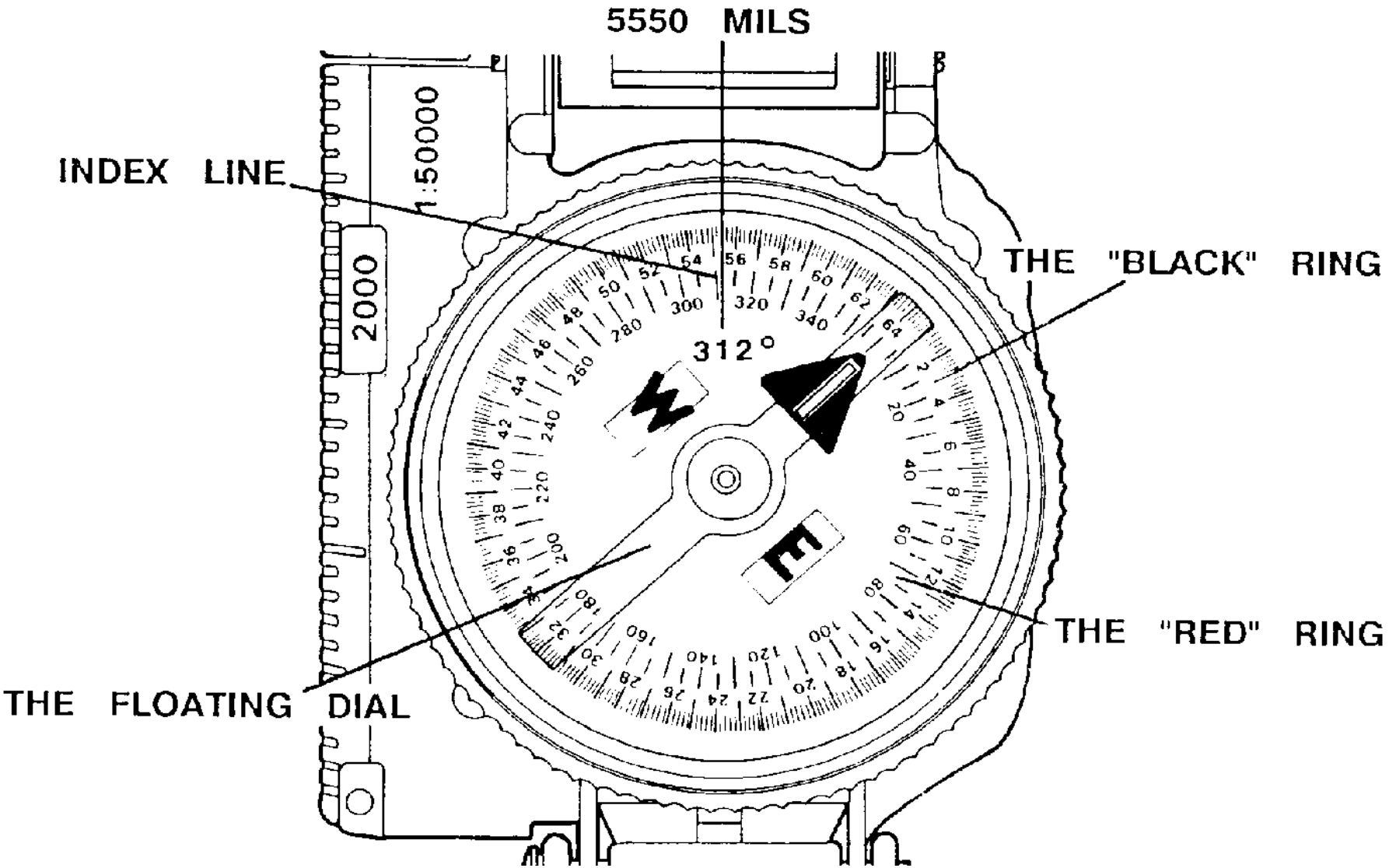
GRID CONVERGENCE
0°5' (1 MIL)
FOR CENTER OF SHEET

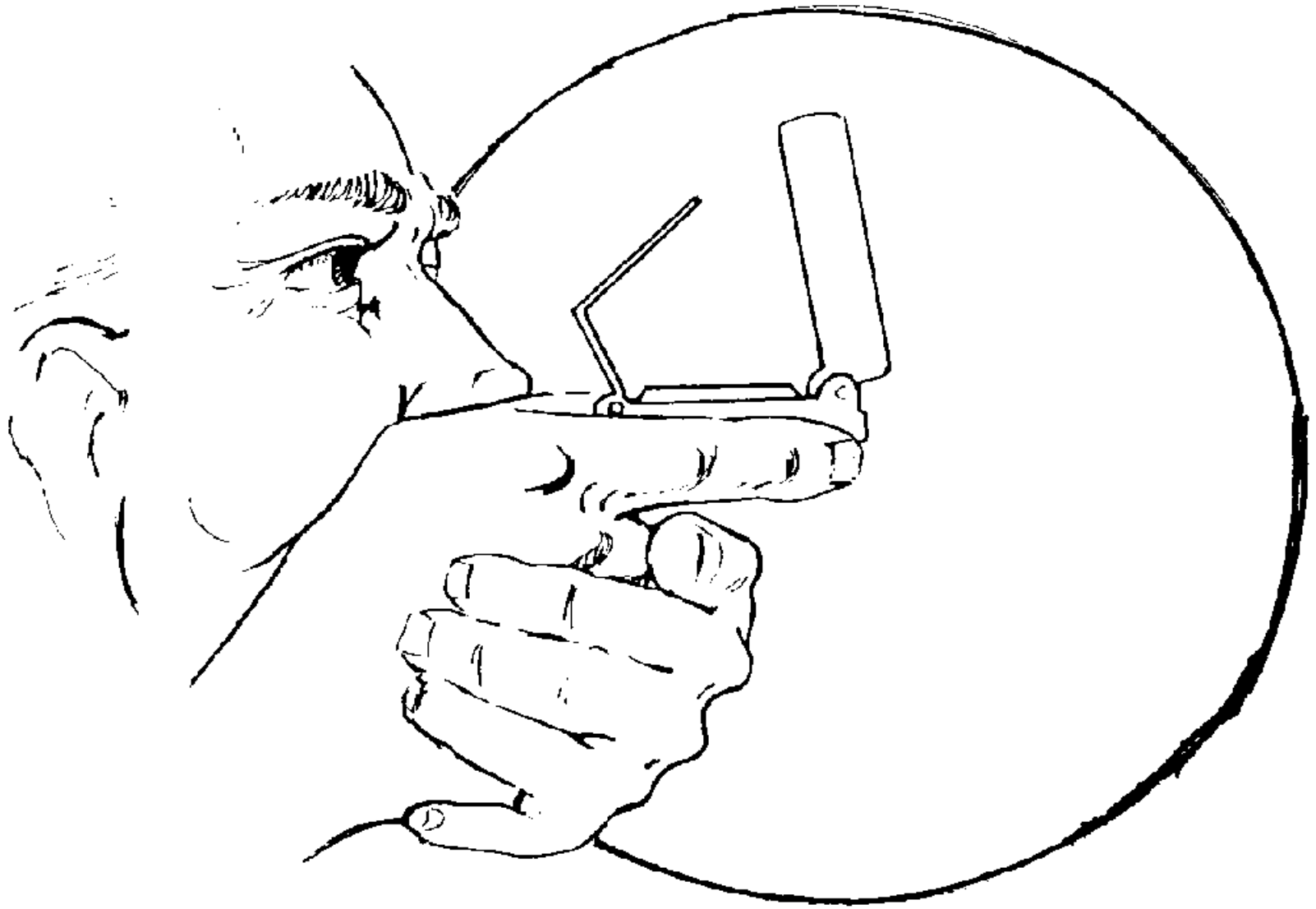
1975
G-M ANGLE
21° (370 MILS)

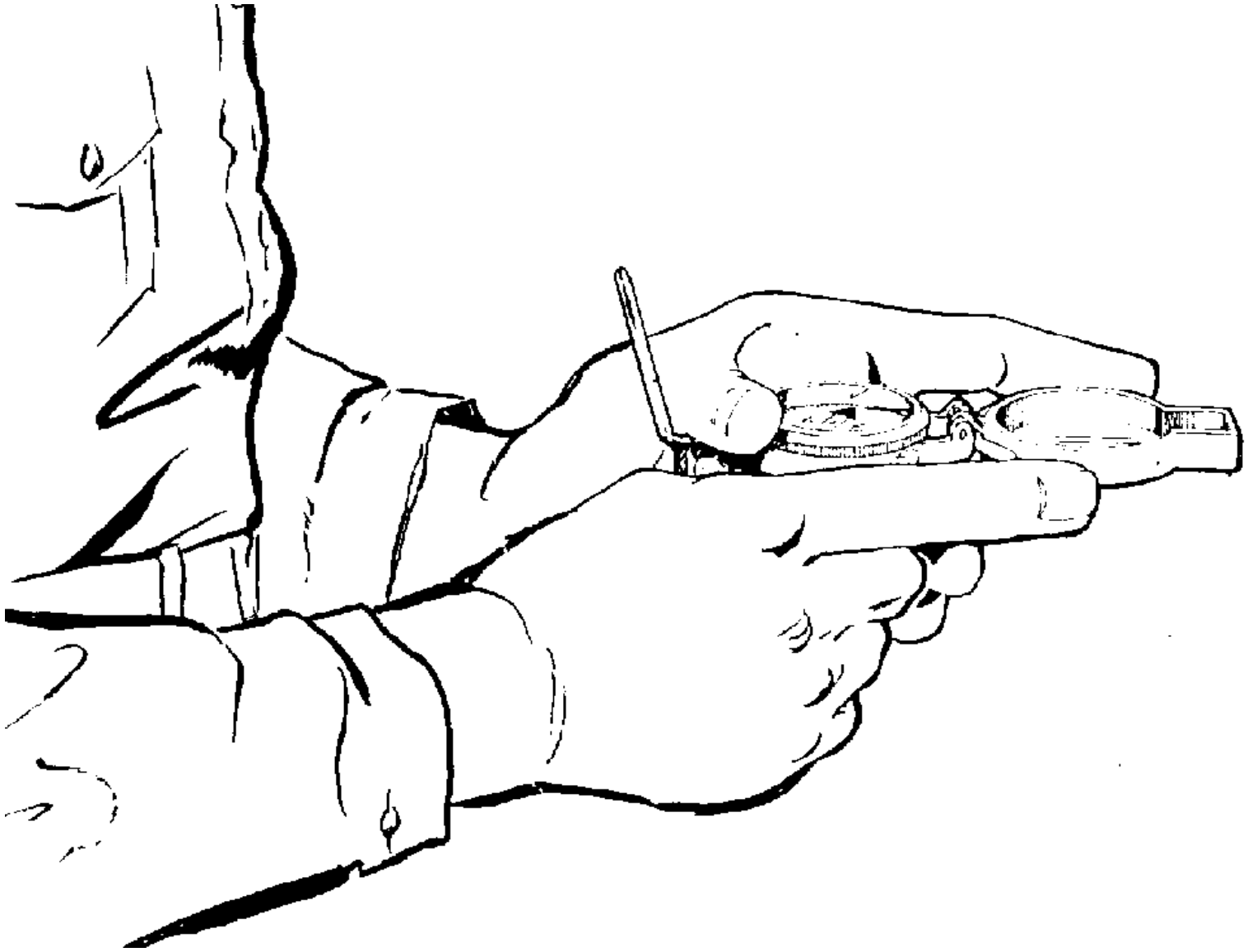
Determine Azimuth

- Plot location of two points
- Use straight edge to draw line between both points (line must be long enough to cross scale on protractor)
- Use protractor to determine azimuth

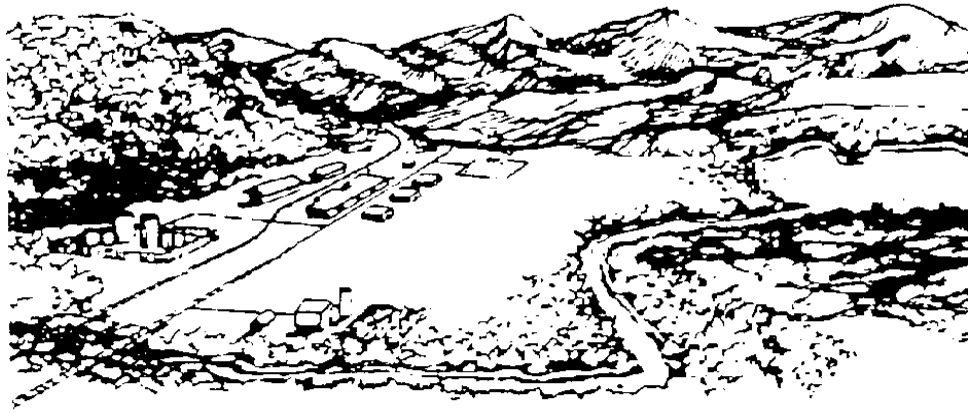

SIGHTING SLOT
LENS
INDEX LINE
THUMB LOOP
SIGHTING WIRE

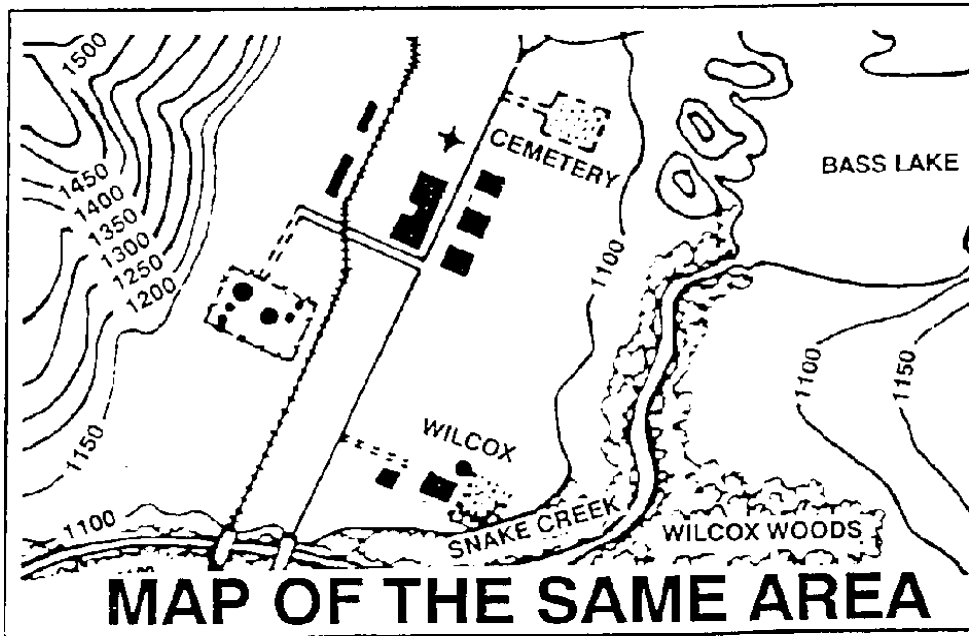

5550 MILS
INDEX LINE
1:50000
2000
312°
THE "BLACK" RING
THE "RED" RING
THE FLOATING DIAL





AN AREA VIEWED FROM A GROUND POSITION





MAP OF THE SAME AREA

Determine Back Azimuth

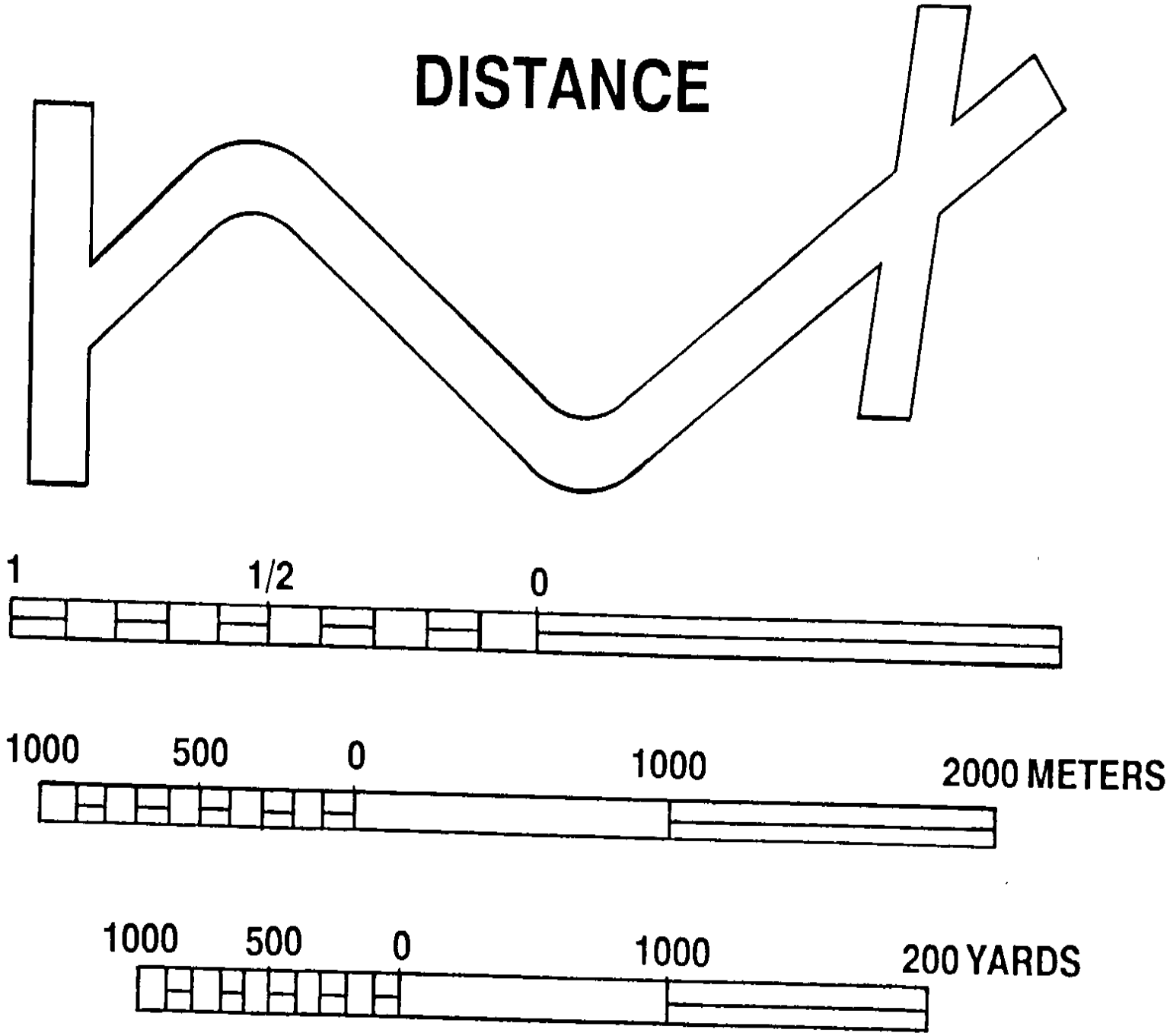
Back Azimuth

- Back Azimuth - azimuth taken from a distant point toward your location
- Used in Resection
- Numbers less than 180 - add 180
- Numbers greater than 180 - subtract 180

Determine Distance

Determine Distance

- Straight Line
  - Use edge of paper and mark distance between points
  - Line paper up next to scale to determine distance
- Road Distance
  - Break curve into series of straight lines and measure from curve to curve
  - Line paper up next to scale to determine distance


DISTANCE
1
1/2
0
1000
500
0
1000
2000 METERS
1000
500
0
1000
200 YARDS

Advanced Skills

- Intersection
  - Single Point, 2-Point, etc
- Resection
  - Single Point, Dual Point, etc